	Type	Hits	Search Text	DBs
1	BRS	1700	429/30,32,33.ccls.	USPAT; US-PGPUB
2	BRS	7	(sulfonated adj polyarylene) and (fuel adj cell) and membrane	USPAT; US-PGPUB
3	BRS	19	sulfonated adj polyarylene	EPO; JPO; DERWENT
4	BRS	4	(sulfonated adj polyarylene) and (fuel adj cell) and membrane	EPO; JPO; DERWENT
5	BRS	1	sulfonated adj arylene adj copolymer	USPAT; US-PGPUB; EPO; JPO; DERWENT
6	BRS	8	sulfonated adj polyarylene	USPAT; US-PGPUB
7	BRS	0	sulfonated adj arylene	EPO; JPO; DERWENT
8	BRS	5	sulfonated adj arylene	USPAT; US-PGPUB; EPO; JPO; DERWENT
9	BRS	3	(sulfonated adj arylene) and (fuel adj cell) and membrane	USPAT; US-PGPUB; EPO; JPO; DERWENT
10	BRS	516	membrane same (water adj absorption)	USPAT; US-PGPUB; EPO; JPO; DERWENT
11	BRS	120	(membrane same (water adj absorption)) same (weight)	USPAT; US-PGPUB; EPO; JPO; DERWENT
12	BRS	31	((membrane same (water adj absorption)) same (weight)) and (fuel adj cell)	USPAT; US-PGPUB; EPO; JPO; DERWENT
13	BRS	11	membrane same (sulfonated adj polyarylene)	USPAT; US-PGPUB; EPO; JPO; DERWENT
14	BRS	5	(membrane same (sulfonated adj polyarylene)) and aromatic	USPAT; US-PGPUB; EPO; JPO; DERWENT
15	BRS	5	((membrane same (sulfonated adj polyarylene)) and aromatic) and (fuel adj cell)	USPAT; US-PGPUB; EPO; JPO; DERWENT

	Type	Hits	Search Text	DBs
16	BRS	16	(polyarylene adj sulfide) same (water adj absorption)	USPAT; US-PGPUB; EPO; JPO; DERWENT
17	BRS	25	(polyarylene adj sulfide) same (hot adj water)	USPAT; US-PGPUB; EPO; JPO; DERWENT

L2 ANSWER 1 OF 14 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 2003:560877 CAPLUS
DOCUMENT NUMBER: 139:292987
TITLE: An investigation of proton conduction in select PEM's and reaction layer interfaces-designed for elevated temperature operation
AUTHOR(S): Ma, Chengsong; Zhang, Lei; Mukerjee, Sanjeev; Ofer, David; Nair, Bindu
CORPORATE SOURCE: Department of Chemistry, Northeastern University, Boston, MA, 02115, USA
SOURCE: Journal of Membrane Science (2003), 219(1-2), 123-136
CODEN: JMESDO; ISSN: 0376-7388
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The proton cond. of several alternative proton exchange membranes, i.e. SPES-40 (a **sulfonated polyarylene** ether sulfone), SPSS-40 (sulfonated polysulfide sulfone) and SPES-PS (a polyether sulfone post-sulfonated) were studied using a four-probe ac-impedance method as a function of temp. Further, proton cond. was also investigated for the same ionomers in the form of micro-aggregates such as those typically encountered in the reaction layer (the interfacial layer of the electrode contg. the catalyst). For this a new configuration of the conventional reaction layer in a membrane electrode assembly (MEA) was used, which enabled the isolation of proton cond. to be the principle contributor to the ac-impedance. The results under 100% relative humidity, showed that SPES-40 has similar proton cond. as Nafion in the membrane within our exptl. conditions. The values for the other membranes investigated were lower. Attempts to correlate these obsd. differences with parameters such as equiv. wt. (EW), water uptake (.lambda.), acidity (pKa), etc. showed that the prime contributor was the difference in microstructure of the membranes. Cond. of these polymeric ionomers when present as micro-aggregates in the reaction layer showed very different values as compared to the bulk membranes. There was a great divergence in conduction as a function of increase in temp. with Nafion showed a far greater rate of increase of cond. than SPES-50 and SPES-PS. Blends of these ionomers with Nafion showed intermediate values, albeit lower with characteristics closer to Nafion. Single cell PEM polarization curves were measured for both Nafion 117 and SPES-40 membrane keeping the ionomer in the reaction layer same as the membrane. Comparison of the performance showed similar ohmic polarization characteristics. However, their performance in the low c.d. activation polarization region indicated poorer oxygen redn. reaction kinetics with SPES-40 material as compared to Nafion.
REFERENCE COUNT: 37 THERE ARE 37 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 2 OF 14 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 2003:521094 CAPLUS
DOCUMENT NUMBER: 139:152264
TITLE: Direct methanol **fuel cell** performance using sulfonated poly(arylene ether sulfone) random copolymers as electrolytes
AUTHOR(S): Pivovar, Bryan S.; Hickner, Michael; Wang, Feng; McGrath, James; Zelenay, Piotr; Zawodzinski, Thomas A., Jr.
CORPORATE SOURCE: Fuel Cells and Electrochemistry, MST-11, Los Alamos National Laboratory, Los Alamos, NM, 87545, USA
SOURCE: Pre-Print Archive - American Institute of Chemical Engineers, [Spring National Meeting], New Orleans, LA, United States, Mar. 11-14, 2002 (2002), 2433-2440. American Institute of Chemical Engineers: New York, N. Y.
CODEN: 69DXU5

DOCUMENT TYPE: Conference; (computer optical disk)
LANGUAGE: English
AB Sulfonated poly(arylene ether sulfone) random copolymers are a new series of sulfonic acid-contg. polymers that have shown promise as **fuel cell** electrolytes. We report on direct methanol **fuel cell** (DMFC) performance of this class of polymers at sulfonation levels 40-60% (monomer basis). The DMFC performance of these polymers is compared to that of Nafion 117, the long-standing std. in **fuel cell** testing. These polymers show a higher selectivity for protons over methanol for all the sulfonation levels tested, with the 40% sulfonated polymer showing 2.5 times the selectivity of Nafion. While the higher sulfonated forms (50 and 60%) did show a higher selectivity, only the lower sulfonation levels (40 and 45%) have shown improved performance in DMFC testing. The results of these expts. are discussed in terms of the relevant test conditions, and exptl. detd. membrane properties. The relevant DMFC properties of these polymers are discussed in terms of sulfonation level and compared to those of Nafion 117.
REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 3 OF 14 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 2003:510153 CAPLUS
DOCUMENT NUMBER: 139:77168
TITLE: **Sulfonated polyarylene** composition and proton-conductive membrane
INVENTOR(S): Okaniwa, Motoki; Goto, Kohei
PATENT ASSIGNEE(S): JSR Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 13 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2003183526	A2	20030703	JP 2001-391748	20011225

PRIORITY APPLN. INFO.: JP 2001-391748 20011225
AB The compn. contains a **sulfonated polyarylene**, a hindered phenol with mol. wt. .gtoreq.500, and a hindered amine with mol. wt. .gtoreq.500. The proton-conductive membrane, useful as a solid electrolyte in a **fuel cell**, etc., is made of the compn. showing resistance to oxidn. and mech. strength.

L2 ANSWER 4 OF 14 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 2003:437206 CAPLUS
DOCUMENT NUMBER: 139:232899
TITLE: Oxygen permeation studies on alternative proton exchange membranes designed for elevated temperature operation
AUTHOR(S): Zhang, Lei; Ma, Chengsong; Mukerjee, Sanjeev
CORPORATE SOURCE: Department of Chemistry, Northeastern University, Boston, MA, 02115, USA
SOURCE: Electrochimica Acta (2003), 48(13), 1845-1859
CODEN: ELCAAV; ISSN: 0013-4686
PUBLISHER: Elsevier Science Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Kinetic and mass transport properties were investigated for the oxygen redn. reaction in Nafion 117 and a sulfonated poly (arylene ether sulfone) membrane (SPES-40, 40% sulfonated groups/repeat unit) under 1 atm oxygen pressure, 100% relative humidity in a temp. range of 303-343 K using a solid-state electrochem. cell. Kinetic parameters were obtained using slow-sweep voltammetry while mass transport parameters, the diffusion

coeff. (D) and soly. (C), were obtained using chronoamperometry at a Pt (microelectrode)/proton exchange membrane (PEM) interface. Oxygen redn. kinetics was found to be similar for both Nafion 117 and SPES-40 membrane at the Pt microelectrode interface. The temp. dependence of O2 permeation parameters showed same trends for both the membranes studied, there was an increase in D and a concomitant decrease in C. Despite lower equiv. wt. and hence higher water content SPES-40 exhibited relatively close values of D with Nafion 117. The results are discussed in the context of their different microstructures. Values of C showed a closer relationship to water content and the percent vol. of aq. phase in the resp. membranes. The values of overall oxygen permeability were significantly higher in Nafion 117, with a higher pos. slope in its variation with temp.

REFERENCE COUNT: 74 THERE ARE 74 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 5 OF 14 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 2003:414164 CAPLUS
DOCUMENT NUMBER: 138:404346
TITLE: Polymer-stabilized precious metal colloids insensitive to oxidation
INVENTOR(S): Bender, Michael; Wessel, Helge
PATENT ASSIGNEE(S): BASF Aktiengesellschaft, Germany
SOURCE: Eur. Pat. Appl., 9 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1315221	A2	20030528	EP 2002-26398	20021126
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK				
DE 10157916	A1	20030605	DE 2001-10157916	20011126
US 2003100443	A1	20030529	US 2002-303830	20021126
JP 2003226905	A2	20030815	JP 2002-342611	20021126

PRIORITY APPLN. INFO.: DE 2001-10157916 A 20011126

AB An oxidn.-insensitive polymer-stabilized precious metal colloid contains precious metal particles on whose surfaces is coordinated .gtoreq.1 polymer contg. sulfonic acid or phosphonic acid groups. The polymer is selected from sulfonated, partially fluorinated, or fluorinated polystyrene; sulfonated, partially fluorinated, or fluorinated alkylene/styrene copolymers; sulfonated perfluorinated alkylene/alkylene oxide copolymer, sulfonated polystyrene, **sulfonated polyarylene** oxide, **sulfonated polyarylene** ether sulfonate, **sulfonated polyarylene** ether ketones, sulfonated polyphenylene, sulfonated polyphenylene sulfide, and phosphonated arylene oxides and phosphonated polybenzimidazoles; whereby the polymers may contain other substituents. The precious metal catalysts find application as **fuel cell** electrocatalysts, as catalysts in H2O2 synthesis, or as oxidn. catalysts.

L2 ANSWER 6 OF 14 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 2003:381130 CAPLUS
DOCUMENT NUMBER: 138:338624
TITLE: Sulfonated poly(arylene ether)-B-poly(imide) segmented copolymers
AUTHOR(S): Mecham, J. B.; Wang, F.; Glass, T. E.; Xu, J.; Wilkes, G. L.; McGrath, J. E.
CORPORATE SOURCE: Center for High Performance Adhesives and Composites, Virginia Polytechnic and State University, Blacksburg, VA, 24061-0344, USA
SOURCE: Polymeric Materials Science and Engineering (2001),

84, 105-106
CODEN: PMSEDG; ISSN: 0743-0515
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The utilization of wholly arom. poly(arylene ether)s bearing sulfonic acid ion-conducting pendant groups is of interest for proton exchange membranes (PEM) for **fuel cells**. Highly sulfonated systems (IEC - 2.81 meq/g) are actually are water-sol. Although this is of interest for some applications, the proton exchange membrane must be insol. in aq. acidic environments. Thus, functionalized systems, particularly bearing telechelic meta amino end groups, were synthesized by controlling the stoichiometry to react an excess of the sulfonated activated halide, a deficiency of the bisphenol (e.g., biphenol), and proper endcapping with meta amino phenol, to afford Mn values of 10,000, 20,000 or even 30,000 g/mol which are quant. functionalized with aryl amine endgroups. Ongoing research is focusing on the synthesis of novel segmented polyimide copolymers that exhibit two-phase behavior by AFM. The objective is to control swelling and provide enhanced strength at elevated temps. This paper describes the synthesis and characterization of the functionalized oligomers and segmented copolymers focusing on their potential for self-assembling to provide PEM components for **fuel cells**

REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 7 OF 14 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 2002:778349 CAPLUS
DOCUMENT NUMBER: 137:297409
TITLE: Solid polymer electrolyte **fuel cell**
INVENTOR(S): Asano, Yoichi; Nanaumi, Masaaki; Sohma, Hiroshi; Kanaoka, Nagayuki; Saito, Nobuhiro; Andou, Keisuke; Fukuda, Kaoru; Matsuo, Junji
PATENT ASSIGNEE(S): Honda Giken Kogyo Kabushiki Kaisha, Japan
SOURCE: PCT Int. Appl., 94 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002080294	A1	20021010	WO 2002-JP3256	20020401
W: CA, DE, US				
JP 2002298868	A2	20021011	JP 2001-97801	20010330
JP 2002298856	A2	20021011	JP 2001-97803	20010330
JP 2002298857	A2	20021011	JP 2001-97804	20010330
JP 2002298858	A2	20021011	JP 2001-97805	20010330
JP 2002298855	A2	20021011	JP 2001-97806	20010330
JP 2002305007	A2	20021018	JP 2001-106648	20010405

PRIORITY APPLN. INFO.:
JP 2001-97801 A 20010330
JP 2001-97803 A 20010330
JP 2001-97804 A 20010330
JP 2001-97805 A 20010330
JP 2001-97806 A 20010330
JP 2001-106648 A 20010405

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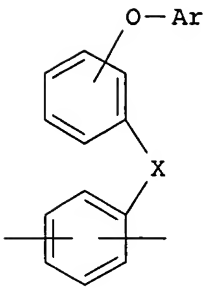

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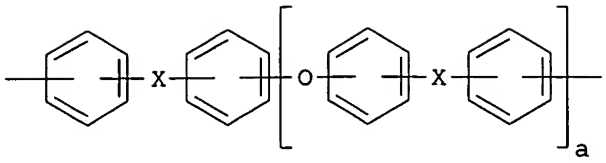

II

AB The **fuel cell** has a polymer electrolyte membrane held between a cathode and an anode, both having an ion conductor contg. catalyst layer; where the electrolyte or the ion conductor in either or both electrodes is a **sulfonated polyarylene** having sulfonic acid group at side chains. Preferably, the electrolyte has a kinematic viscoelasticity 109-1011 Pa at 110.degree., and is a copolymer contg. 30-95 mol% I [Ar = aryl group, X = -CO-, -CONH-, -(CF2)1-10-, -C(CF3)-, -COO-, -SO-, or -SO2-] and 5-30 mol% II (X may be different from each other, a = integer 0-3); and the ion conductive binder in the electrode has a kinematic viscoelasticity lower than that of the electrolyte, and is a copolymer contg. 50-70mol% I and 30-560 mol% II (a = integer .gtoreq.2).

REFERENCE COUNT: 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 8 OF 14 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 2002:671788 CAPLUS
DOCUMENT NUMBER: 137:219504
TITLE: Sulfonated polyketone-polyphenylenes as polymer electrolyte ion-exchange membranes for **fuel cells**
INVENTOR(S): Asano, Yoichi; Nanaumi, Masaaki; Sohma, Hiroshi; Kanaoka, Nagayuki; Saito, Nobuhiro
PATENT ASSIGNEE(S): Honda Giken Kogyo K.K., Japan
SOURCE: Ger. Offen., 18 pp.
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 10201691	A1	20020905	DE 2002-10201691	20020117
JP 2002216800	A2	20020802	JP 2001-12490	20010119
JP 3442741	B2	20030902		
JP 2002298869	A2	20021011	JP 2001-97802	20010330

PRIORITY APPLN. INFO.: JP 2001-12490 A 20010119
JP 2001-97802 A 20010330

AB Polymer electrolyte membranes for **fuel cells** are prepd. by subjecting an ionic-conducting membrane, composed of an arom. polymer, to a hot water treatment such that the treated polymer has a water absorption capacity of 80-300%, based on the dry wt. prior to the treatment. The ionic-conducting membranes are composed of: (1) 30-95 mol% units of a **sulfonated polyarylene**, of general structure -C6H3(R)-, in which R = -X-C6H4-OAr, Ar is an aryl group, and X is a divalent electron-withdrawing group, such as -C(:O)-, -C(:O)-NH-, -(CF2)p- (p = 1-10), -C(CF3)2-, -C(:O)O-, -S(:O)-, and -SO2-, and (2) 5-70 mol% units of a second monomer, of general structure -C6H4-X-C6H4-(O-C6H4-X-C6H4)a-, in which X is the same as above, and a = 0-3. These composite membranes are composed of a first sulfonated arom. polymer with a high

ion-exchange capacity and a second sulfonated arom. polymer, with a smaller ion-exchange capacity, yet acts as a reinforcing material in the form of fibers or a porous membrane.

L2 ANSWER 9 OF 14 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 2002:571485 CAPLUS
DOCUMENT NUMBER: 137:143007
TITLE: Polymer electrolyte membrane and solid polymer electrolyte **fuel cell**
INVENTOR(S): Asano, Yoichi; Nanaumi, Masaaki; Kanaoka, Nagayuki; Sohma, Hiroshi; Saito, Nobuhiro; Matsuo, Junji; Goto, Kohei; Takahashi, Masayuki; Naito, Yuji; Masaka, Fusazumi
PATENT ASSIGNEE(S): Honda Giken Kogyo K.K., Japan; JSR Corp.
SOURCE: Ger. Offen., 40 pp.
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 10201886	A1	20020801	DE 2002-10201886	20020118
JP 2002216797	A2	20020802	JP 2001-12361	20010119
JP 3412762	B2	20030603		
JP 2002216798	A2	20020802	JP 2001-12362	20010119
JP 3412763	B2	20030603		
JP 2002216790	A2	20020802	JP 2001-12363	20010119
JP 3411562	B2	20030603		
JP 2002216799	A2	20020802	JP 2001-12489	20010119
US 2002172850	A1	20021121	US 2002-51199	20020122

PRIORITY APPLN. INFO.: JP 2001-12361 A 20010119
JP 2001-12362 A 20010119
JP 2001-12363 A 20010119
JP 2001-12489 A 20010119

AB A polymer composite electrolyte membrane is formed from a first polymer electrolyte comprising a **sulfonated polyarylene** polymer and a second polymer electrolyte comprising an another hydrocarbon polymer electrolyte. The first polymer electrolyte consists of 2-70 mol% of an arom. compd. unit with an electron-attractive group in its main chain, while 30-98 mol% of it consist of an arom. compd. unit without electron-attractive group in the main chain. The second polymer electrolyte is a sulfonated polyether electrolyte or a sulfonated polysulfide electrolyte. The polymer composite electrolyte membrane is formed from a matrix, which covers the first polymer electrolyte, selected from **sulfonated polyarylene** polymers, and contains an ion exchange capacity of >1.5 meq/g, but <3.0 meq/g, which is carried on a reinforcement; the second polymer electrolyte has an ion exchange capacity of >0.5 meq/g, but <1.5 meq/g. The polymer electrolyte membrane covers a polyarylene polymer, which is so sulfonated that the Q-value lies within the range of 0.09-0.18 C/cm2.

L2 ANSWER 10 OF 14 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 2002:281429 CAPLUS
DOCUMENT NUMBER: 137:79794
TITLE: Proton exchange membrane nanocomposites
AUTHOR(S): Hickner, Michael A.; Kim, YuSeung; Wang, Feng; McGrath, James E.; Zawodzinski, Thomas A.
CORPORATE SOURCE: Department of Chemistry and Materials Research Institute, Virginia Polytechnic Institute and State University, Blacksburg, VA, 24061, USA
SOURCE: Proceedings of the American Society for Composites, Technical Conference (2001), 16th, 323-336

CODEN: PAMTEG; ISSN: 1084-7243
PUBLISHER: CRC Press LLC
DOCUMENT TYPE: Journal; (computer optical disk)
LANGUAGE: English
AB Polymeric membrane nanocomposites incorporating phosphotungstic acid were synthesized as candidates for **fuel cell** proton exchange membranes. The matrix polymers for the nanocomposites were sulfonated poly(arylene ether sulfone)s. The main goal of this research is to improve upon purely polymeric proton exchange membranes and allow the **fuel cell** to be run at temps. greater than 100.degree.C. The phosphotungstic acid serves to improve the protonic cond. of the membrane while decreasing the water absorption. This is a surprising result, as with most sulfonic acid-base membranes, protonic cond. has been directly related to membrane water content. In addn., the inorg. filler also improves the modulus of the material.
REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 11 OF 14 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 2001:846076 CAPLUS
DOCUMENT NUMBER: 136:102739
TITLE: Synthesis of highly sulfonated poly(arylene ether sulfone) random (statistical) copolymers via direct polymerization
AUTHOR(S): Wang, Feng; Hickner, Michael; Ji, Qing; Harrison, William; Mecham, Jeffrey; Zawodzinski, Thomas A.; McGrath, James E.
CORPORATE SOURCE: Department of Chemistry and Materials Research Institute (0344), Virginia Polytechnic Institute and State University, Blacksburg, VA, 24061, USA
SOURCE: Macromolecular Symposia (2001), 175(Polymerization Processes and Polymer Materials II), 387-395
CODEN: MSYMEC; ISSN: 1022-1360
PUBLISHER: Wiley-VCH Verlag GmbH
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Novel biphenol-based wholly arom. poly (arylene ether sulfones) contg. pendant sulfonate groups were prepd. by direct arom. nucleophilic substitution polycondensation of disodium 3,3'-disulfonate-4,4'-dichlorodiphenyl sulfone (SDCDPS), 4,4'-dichlorodiphenylsulfone (DCDPS) and biphenol. Copolymn. proceeded quant. to high mol. wt. in N-methyl-2-pyrrolidinone at 190.degree.C in the presence of anhyd. potassium carbonate. Tough membranes were successfully cast from the control and the copolymers, which had a SDCDPS/DCDPS mole ratio of either 40:60 or 60:40 using N,N-dimethylactamide; the 100% SDCDPS homopolymer was water sol. Short-term aging (30 min) indicates that the desired acid form membranes are stable to 220.degree.C in air and cond. values at 25.degree.C of 0.110 (40%) and 0.170 S/cm (60%) were measured, which are comparable to or higher than the state-of-the art fluorinated copolymer Nafion 1135 control. The new copolymers, which contain ion cond. sites on deactivated rings, are candidates as new polymeric electrolyte materials for proton exchange membrane (PEM) **fuel cells**. Further research comparing their membrane behavior to post-sulfonated systems is in progress.
REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 12 OF 14 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 2001:760440 CAPLUS
DOCUMENT NUMBER: 135:304937
TITLE: Preparation of curable polyarylenes bearing sulfonic acid for proton-conductive membranes
INVENTOR(S): Takahashi, Masayuki; Goto, Kohei; Igarashi, Katsutoshi
PATENT ASSIGNEE(S): JSR Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 14 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001291443	A2	20011019	JP 2000-102976	20000405

PRIORITY APPLN. INFO.: JP 2000-102976 20000405

AB Title membranes with high H+ cond. at wide temp. region, suitable for battery electrolytes, solid polyme electrolytes, **fuel cells**, display devices, sensors, capacitors, solid condensers, ion-exchange membranes, etc. (no data), are prepd. by irradiating of **sulfonated polyarylene** films with electron beam. Thus, a sulfonated poly[(4-phenoxybenzoyl)-1,4-phenylene] was dissolved in DMF, coated on a glass plate, and irradiated with electronic beam 60 Mrad to give a film with H+ cond. at 80.degree. 4.2 x 10-2 S/cm2 and exhibiting good strength, durability, and swelling resistance in water at 90.degree..

L2 ANSWER 13 OF 14 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 2001:585306 CAPLUS
DOCUMENT NUMBER: 135:360132
TITLE: Heteropolyacid/sulfonated poly(arylene ether sulfone) composites for proton exchange membranes **fuel cells**
AUTHOR(S): Kim, Yu Seung; Wang, Feng; Hickner, Michael; Zawodzinski, Tom A.; McGrath, James E.
CORPORATE SOURCE: Department of Chemistry and Material Research Institute, Virginia Polytechnic Institute and State University, Blacksburg, VA, 24061, USA
SOURCE: Polymeric Materials Science and Engineering (2001), 85, 520-521
CODEN: PMSEDG; ISSN: 0743-0515
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The prepn. of composite membranes for use as proton exchange membranes in **fuel cells** at high temps. involves the incorporation of the solid heteropolyacid (hpa), H3PW12O40, in a poly(arylene ether sulfone) contg. pendant sulfo groups. The poly(arylene ether sulfone) is prepd. by reacting 4,4'-dichlorodiphenyl sulfone, 3,3'-disodoisulfo-4,4'-dichlorodiphenyl sulfone and 4,4'-biphenol. The HPA extn. behavior, morphol., thermal and mech. properties, and proton conduction at elevated temp. of the composite membrane are discussed.

REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 14 OF 14 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 1993:675063 CAPLUS
DOCUMENT NUMBER: 119:275063
TITLE: Partially sulfonated poly(arylene ether sulfone) - a versatile proton conducting membrane material for modern energy conversion technologies
AUTHOR(S): Nolte, R.; Ledjeff, K.; Bauer, M.; Muelhaupt, R.
CORPORATE SOURCE: Fraunhofer-Inst. Sol. Energiesyst., Freiburg/Br., W-7800, Germany
SOURCE: Journal of Membrane Science (1993), 83(2), 211-20
CODEN: JMESDO; ISSN: 0376-7388
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Sulfonated poly(arylene ether sulfones) with various sulfonation levels were prepd. and evaluated as solid polymer electrolytes in electrolyzers

and **fuel cells**. Soln. and slurry sulfonation of poly(arylene ether sulfones) such as Udel P-1700 (PSU) and Victrex PES 5200P (PES) yield polyelectrolytes which were characterized using FTIR and 1H-NMR spectroscopy, titrn., thermal anal., and electrochem. characterization, e.g., resistivity, selectivity of ion permeation, current/voltage plot, and life time test in an electrolysis cell. In contrast to the sulfonated PSU, the PES sulfonated in a slurry process was water insol., even at high sulfonation levels of 90 mol%, and gave significantly improved electrochem. properties similar to those of fluorine-contg. polyelectrolytes used in com. membrane systems. A versatile in-situ crosslinking technique was developed to crosslink the sulfonated poly(arylene ether sulfone) electrolytes during membrane processing to substantially reduce water swelling without impairing other membrane properties, e.g., proton cond.

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FILE 'REGISTRY' ENTERED AT 12:37:26 ON 06 NOV 2003
E SULFONATED POLYARYLENE/CN

FILE 'CAPLUS' ENTERED AT 12:38:16 ON 06 NOV 2003
L1 31 S SULFONATED POLYARYLENE
L2 14 S L1 AND (FUEL CELL)

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